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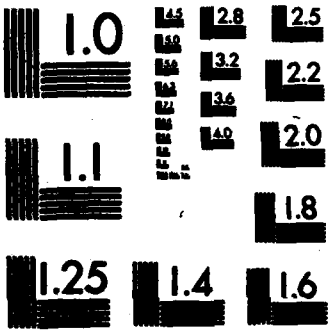

NAVAL INTELLIGENCE SUPPORT CENTER

TRANSLATION DIVISION NISC-62
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TRANSLATION

TITLE: SOVIET NAVY SUBMARINE RESCUE, LIFTING, AND SALVAGE SHIPS

UBOOTRETTUNGSSCHIFFE, HEBESCHIFFE UND BERGESCHIFFE DER SOWJETMARINE

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SOVIET NAVY SUBMARINE RESCUE, LIFTING, AND SALVAGE SHIPS

[Breyer, Siegfried; Ubootrettungsschiffe, Hebeschiffe und Bergeschiffe der Sowjetmarine; Soldat und Technik, No. 5/1983; pp. 256-261; German]

The larger a navy is, the more it is present in the large oceans and in distant sea areas, and all the more important for it to become those components which under the collective term "logistics" provide the means necessary in special cases for their resupply and assistance. In that context, quite a special role falls to the rescue services. They include, to name only a few, submarine salvage ships, lifting ships, and fire boats. They perform their service in the shadow of the far more visible combat units, for in the international literature they both regrettably and undeservedly live out an existence about which hardly anything has ever been written. Our veteran navy associate Siegfried Breyer takes a look at how things are in the naval rescue and salvage services in the Soviet Union. He first features the existing material in his article. At the end of this contribution, which is in several sections, he finally summarizes the overall capability of the Soviet rescue and salvage service. Therefore, light is cast upon a still extensively unknown chapter, which we hope may be of some use for our readers. /256

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Part 1. Submarine Salvage Ships

In the history of submarines, the development of highly specialized submarine salvage ships is solidly ensconced, although their number from the beginning to the present has remained very small and is distributed over just a few navies. Apparently that was (and still is) due to the confident attitude of many navies that they remain immune even to submarine accidents and anyway it is cheaper to call on civilian rescue services for that kind of work if ever, counter to expectation, such an accident happened--in any case cheaper than maintaining one or more such ships.

The beginnings of this ship type go back to imperial Germany of the pre-war period. In the course of the submarine construction, then getting under way, funds for such a ship were made available early on, which, begun in March 1907, was able to be delivered as early as March 1908. It bore the name VULCAN and was a double-hulled (catamaran) ship displacing about 2500 t. Specifically, it consisted of two pontoon hulls arranged parallel to each other at a distance of 6.50 m which were rigidly connected with each other fore and aft with braces. On it was erected a hoist, whose lifting capacity was 500 t. Shortly before the outbreak of war, a second, somewhat larger such ship, CYCLOP, was begun whose lifting capacity was doubled, to 1000 t. The second power which turned to the construction of such ships was Russia. In the course of the "small shipbuilding program" of 23 June 1912, the funds were used for just three units, each one for the Baltic Sea, the Black Sea, and the Far East. Of course, only one of them managed

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*Numbers in right margins indicate pagination in the original text.

to be built, VOLKHOV*, for the world war about to break out soon after

*Besides Germany and Russia, one each such ship was built in Italy and in the Netherlands (for Spain).

brought a halt to further plans.

VOLKHOV was built in St. Petersburg (present-day Leningrad) at the Putilov Shipyard, which was renamed the Marti Shipyard after the Bolshevik Revolution and for some years has again borne its original name, Admiralty Shipyard. It was designed and conceived on the engineering model of the German VULCAN; it, too, was a double-hulled ship, but the displacement and the dimensions were somewhat larger, so that the lifting capacity was also able to be increased. VOLKHOV had twice the capacity of VOLCAN, that is, 1000 t within two hrs from a depth of 60 m.

This ship, renamed KOMMUNA after the Revolution, is still in existence today. Next November it will be 60 years since it was launched. It departed the Baltic Sea for the first time in 1950, when it sailed to the Vlissingen in Holland, where it underwent a general overhaul lasting more than one year. In the summer of 1951, it returned to its home port, Kronstadt, but then a few years later was transferred to the Black Sea, where it is still being kept in readiness for rendering assistance within its capabilities; in any case within NATO its existence is still being reckoned with, although very limited performances can be expected, owing to its great age. This ship was not prominent either in the two world wars or in the years between and after. Especially have there ever been no data so far on its raising operations and its successes in them. It is probably certain that a ship like KOMMUNA is not used alone to raise lost submarines; with its lifting capacity collaboration in raising surface ships is also probable. It probably played a not unimportant role especially in removing wrecks after the second world war in the Gulf of Finland and the sea areas farther westward.

The primary mission originally assigned to such special ships of raising submarines was able to have a priority claim only as long as the weight of the distressed submarine corresponded to the lifting capacity. The specific water depth in which the object to be raised places another restriction. Generally, the employment of such special ships had to be limited to the inshore waters and in any case to the adjacent seas, within which there is no need to penetrate to greater depths.

Today, not the raising of a lost submarine, but the rescue of its crew, is a primary consideration. In the first place, the submarines of today are considerably larger and heavier, and in the second, as the experience of the post-war period shows, they are being lost in deep waters rather than in the generally shallow waters off the coast. Today it involves rather to come to the aid of the crews in the sunken submarines. But that requires a substantially different concept of such rescue ships, which need a completely different type of equipment for that purpose. Of course, such ships should

Captions to photos on next page: Fig. 1. Seventy years old and still operational. The submarine raising ship KOMMUNA dating back to the Czarist era, with its characteristic hoisting gear construction. At the bow it is clear that this is a catamaran-type. However, a much more broadly held opinion is that the KOMMUNA is no longer stationed in the Baltic Sea, but in the Black Sea.

Fig. 2. Submarine salvage ship SS-35 of the T-58/ASR Class, a former T-58-Class seagoing mine hunter.

Fig. 3. PRUT-Class submarine salvage ship. Clearly visible are the two rescue chambers on the port side.

Fig. 4. INDIA-Class rescue submarine, mother ship of two submersibles which are stowed abaft the conning tower.

Fig. 5. ELBRUS. Peak of the Soviet development in this ship category. Between the forward mast and the stack can be seen the two hoists, presumably for lowering and hoisting the submersibles.

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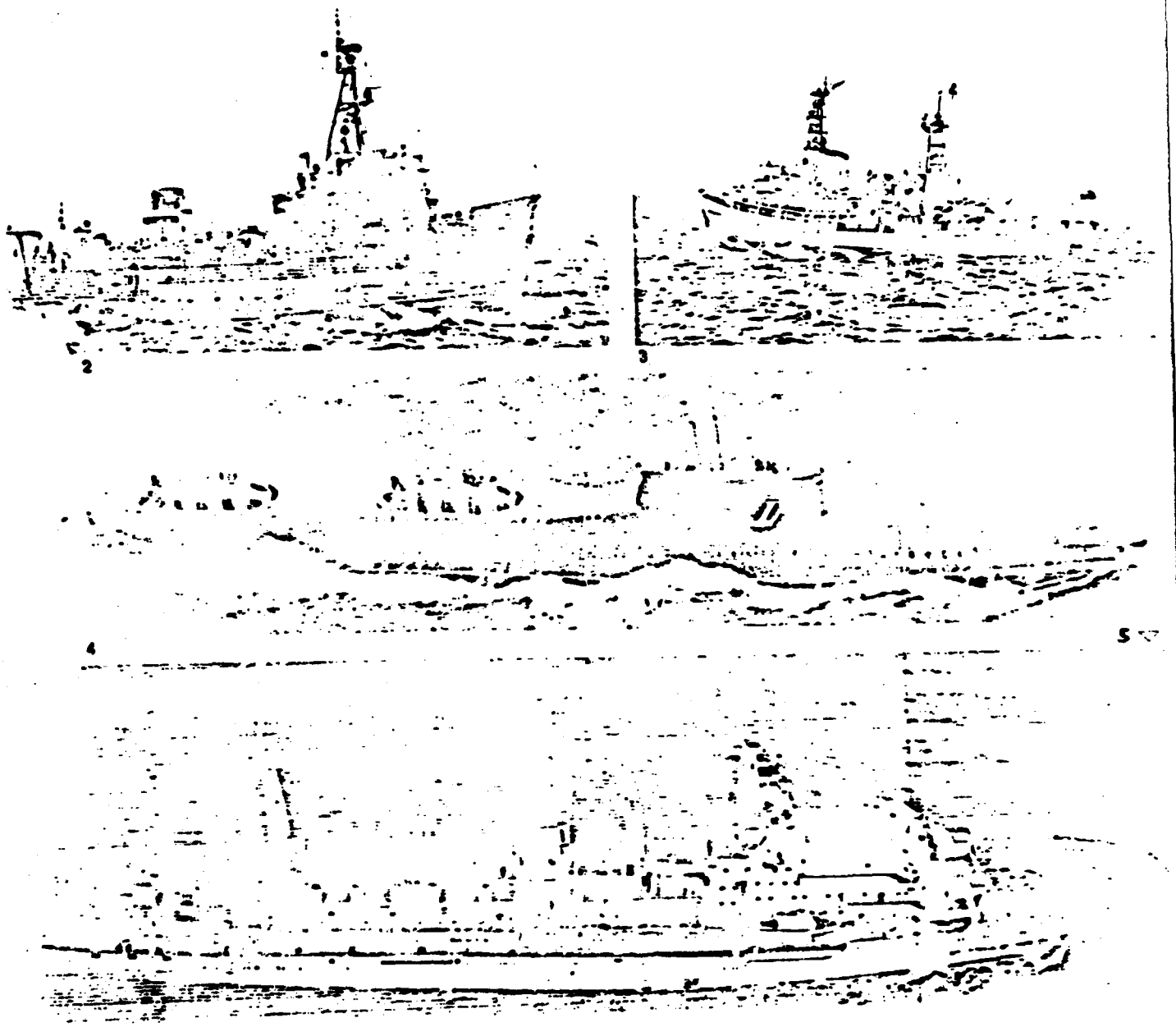


collaborate in such operations, but this is no longer their primary mission, /258 but one of several.

After the end of the second world war, more than a decade passed before the series of new submarine salvage ships of a new class--the NATO designation ASR, for Submarine Rescue Ship derives from the designation--was built in the Soviet Union. Progression in size was in steps, each preceding class is followed by a larger one, so that the equipment became steadily more extensive, which in turn caused the rescue capacity to grow along. Early in the eighties a peak was apparently reached, as we shall explain. Because the sharply growing need for such ships was not initially

to be met adequately by new constructions for the numerical strength of the submarine force, ships appearing suitable for the purposes were converted to ASRs. Therefore the choice fell on a number of seagoing minehunters; with that choice the Soviets were following the same path as the Americans in the early twenties, when they obtained their first submarine rescue ships by converting minehunters.

Below we shall consider in greater detail the development extending over more than three decades.

The Period of Interim Solutions

The rebuilding of the navy which got underway after the end of the war initially brought great growth to the submarine force. With the increase in the number of submarines, however, grew also the danger of accidents, but they were in no way equipped to handle them. An attempt was made to relieve the shortage of submarine rescue ships initially by utilizing captured ships. Thus the Luftwaffe crash boat HANS ALBRECHT WEDEL, which fell victim to a Soviet air attack on 8 April 1945 in Danzig Bay, was raised, and after repairs, was placed in service as the submarine salvage ship KHIBNY and assigned to the Northern Fleet.

To meet the turbulent growth of the Soviet submarine force in the fifties and sixties, a series of 14 units, which started out as T-58-Class seagoing minehunters, were converted into submarine salvage ships in Leningrad starting in 1961-62. In NATO, this series was initially designated the VALDAY Class, after the ship identified first; however, today it is carried as the T-58 (ASR) Class. From the engineering point of view they correspond to the predecessor T-43 (ARS) Class, to which we shall return later. What was still lacking in that class, the T-58 (ASR) Class had as standard equipment on board, and that is a rescue chamber. It is sited on the port side of the midship section, where it is ready for use below a davit. Also present are decompression chambers, pumps, winches, line and wire reels, as well as a shearlegs crane for unshipping heavy gear like buoys, supply lines, etc. Those units, now only 13 in number (11, according to Jane's Fighting Ships 1982-83), after one ship was transferred to India as early as 1971, are still performing their service today, one of them, the ex-GIDROLOG operating in the Pacific, is serving as an ELINT-SIGINT ship. The names of only five ships are known, while the rest carry an alphanumeric designation beginning with the letters SS, like the T-43 (ARS)-Class units already discussed. The following ships are involved:

Name	Alphanumeric Designation	Station
VALDAY	-	Baltic Fleet
KHIBINY	-	Northern Fleet
KAZBEK	-	Black Sea Fleet
ZANGEZUR	-	Black Sea Fleet
ex GIDROLOG	-	Pacific Fleet
-	SS-30	Baltic Fleet
-	SS-35	Baltic Fleet

(Continued from p. 5)

Name	Alphanumeric Designation	Station
-	SS-38	Baltic Fleet
-	SS-53	Baltic Fleet
-	SS-40	Northern Fleet
-	SS-47	Northern Fleet
-	SS-48	Northern Fleet
-	SS-50	Black Sea Fleet

Another ship, SS-55, was transferred to India in 1971.

The way it looks today, it must be concluded that this class is approach- in the end of its existence. Its phasing out during this decade must be expected.

The First New Constructions

In the year 1958, at the then Nosenko Shipyard in Nikolayev, was begun the construction of a series of nine units of submarine rescue ships. Two each of them entered service in 1960 and 1961, and in the subsequent years until 1966, one each year. This was given the NATO designation PRUT Class. Their designs date back to shortly before the mid-fifties; therefore the American CHANTICLEER Class (ASR 7-18) appears to have been the model. Admittedly the latter has a smaller displacement and smaller dimensions, but the external points of agreement are so profound that the "pedigree" cannot be ignored. Accession of the PRUT Class began in 1960, and the last units entered service in 1966.

Those ships, barely 90 m long and over 13 m wide and displacing more than 2600 t, were given extensive equipment for rescue purposes, and are additionally fitted out as tugs. Their maximal towing speed, with a 1500-t tow, is 11 kn. It has the following rescue equipment:

--a rescue observation bell for one man;
--a rescue chamber for three persons from a 60-m depth;
--a rescue chamber for three persons from a 200-m depth;
--two working caissons, and
--four large mooring buoys besides a number of marker buoys.

The two rescue buoys and the rescue observation bells are carried under two davits sited on the side, the marker buoys are on chutes angled to the side in pairs, the other buoys behind or between them, and the working caisson, on the afterdeck. In addition, there are five to seven hoses to fight ship fires.

During the seventies, the stowage of the large mooring buoys was altered: until then they slid off in the longitudinal direction, so that they entered the surface of the water with their end pieces. Therefore turbulence probably occurred, so that they were easily thrown against the side. Under

the present method of stowage, they roll off and maintain the rolling motion after striking the water, so that they are moved away from the ship, and therefore cannot endanger it any more.

Only four of those ships have a name, and of the rest only alphanumeric designations are known, all also beginning with "SS." The following units are involved:

NAME	ALPHANUMERIC DESIGNATION	STATION
ALTAY	-	Northern Fleet
BRESHTAU	ex MB-11	Northern Fleet
VLADIMIR TREFOLEV	SS-87	Baltic Fleet
ZHIGULI	-	Pacific Fleet
...	SS-44	Northern Fleet
...	SS-21 (ex MB-21)	Black Sea Fleet
...	SS-26 (ex MB-26)	Black Sea Fleet
...	SS-23 (ex MB-23)	Pacific Fleet
...	SS-83	Pacific Fleet

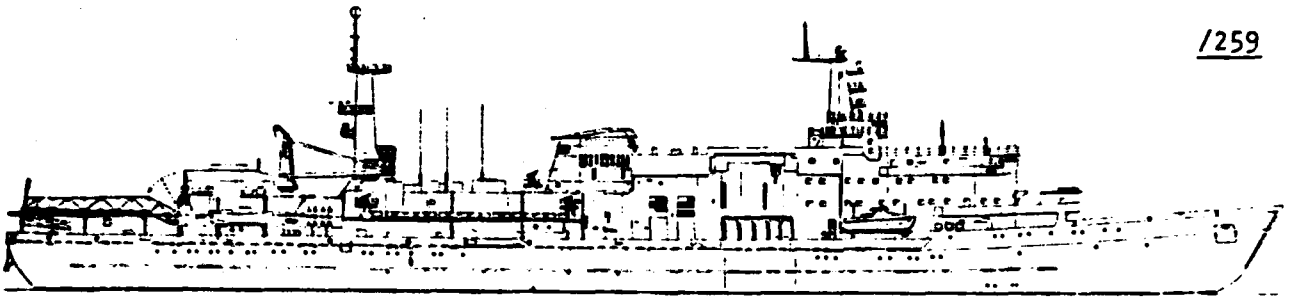
From this table we see the points of concentration: the North Arctic Ocean and the Pacific are assigned as the operations area for three ships each, the Black Sea, for two ships, and the Baltic Sea, for only one. A plausible "care ratio" for the submarines in each of the four fleets cannot be derived from it.* Therefore, there must be another distribution modulus

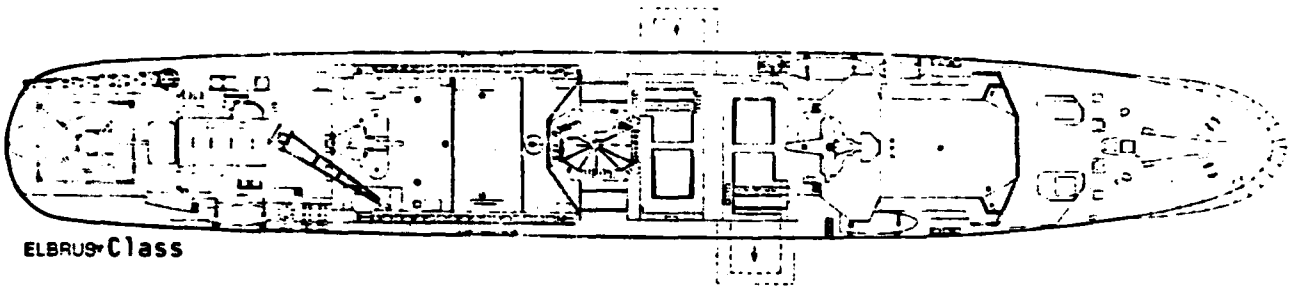
*Proceeding from the submarines existing in the separate fleets on 1 January 1983, the following ratio would therefore result (number of submarines total/ number of submarines falling to one PRUT-Class ship): Northern Fleet - 184/61, Pacific Fleet 137/45, Baltic Fleet 80/80, Black Sea Fleet 64/32.

which does not absolutely need to have anything to do with the number of submarines in any specific case. This is also enlightening, for ships like those of the PRUT Class are not intended exclusively for the rescue service in case of submarine accidents; for those they certainly have special equipment, but they are for the benefit of all ships in distress, if they /260
are in a favorable position to them. Moreover, those ships, if they have no salvage tasks to perform, are used as tugs, in order to work them to capacity.

On a New Path: Submarine Rescue Submarines

Early in the eighties, a new Soviet submarine type, whose NATO type designator was established as SSAG (for "Submarine, Auxiliary"), became known in the INDIA Class; these submarines can be compared in every respect to the similarly fitted out American submarines HALIBUT (SSN 587) and HAWKBILL (SSN 666), even if the latter are intended primarily for combat missions and





ELBRUS-Class

SOVIET SUBMARINE SALVAGE SHIPS
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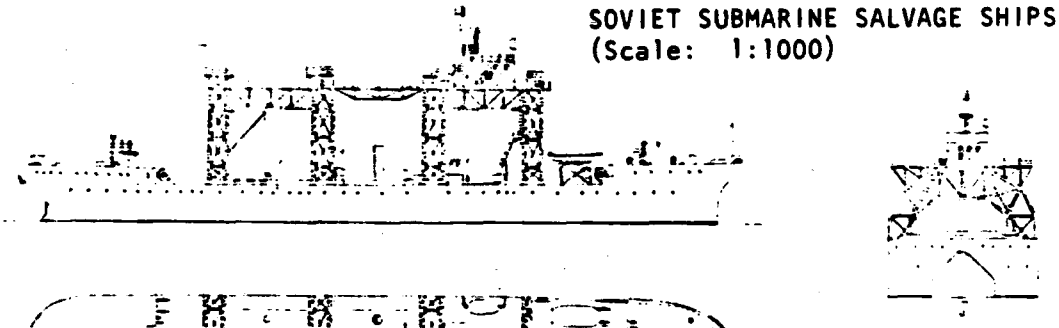
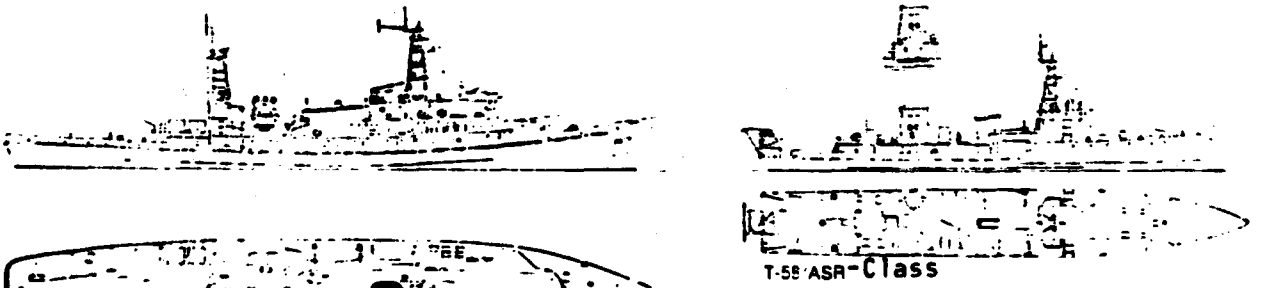
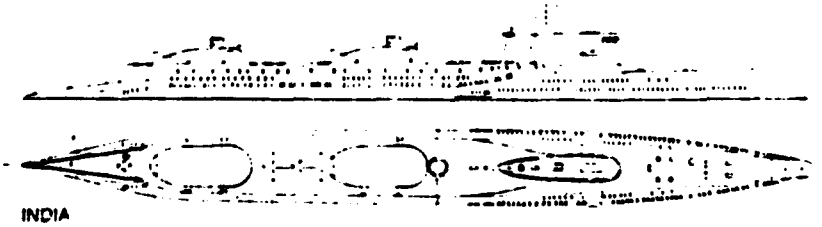


KOMUNA-Class (with front view)



T-58 ASR-Class

PRUT-Class



INDIA-Class

INDIA

only sporadically carry a DSRV* submersible pickaback.

*DSRV = Deep Submergence Rescue Vehicle

Two units of this INDIA Class were built in far eastern Komsomolsk at the Amur Shipyard and put into service in 1979 and 1980 (see Table 1). In them the conning tower stands in a markedly forward position, abaft it the upper deck is visibly elevated and carried parallel to the waterline to far aft. Inside that deck there are installed two trough-like bases in tandem which each accommodate one small rescue vehicle about 12 m in length and up to 4 m in breadth. Presumably for each of those deep submergence vehicles there is a shaft-like connection with the mother submarine over which they must sit. The personnel of the submergence vehicle could then move over through corresponding locks. The units of the INDIA Class presumably cruise to the operations area surfaced, for their hull is apparently designed for surface cruising and they have conventional propulsion. Once they arrive there, they dive to depth and uncouple the two submergence vehicles, which they pick up after their rescue mission. They are shipped aboard in the same manner; for that purpose there are white markings forward and abaft of the troughs as well as on the diving planes mounted on each side of the conning tower as orientation aids in the dark depths to assist them in engaging their holding devices.

There are still no detailed data of the on-board submersibles. More than that, it can still not be stated what their exterior form reveals, and this is little enough, owing to a lack of close-up photos.

One INDIA-Class submarine is already with the Pacific Fleet; the other was deployed in due course via the Northern Sea Route to the Northern Fleet. For the transfer the stem was given a quite unseemly ice cutter, while the two submersible vehicle troughs were covered with plates to prevent the accumulation of ice, by which the trim could have been impaired.

Table 1. INDIA-Class Rescue Submarines

a. Anzahl	2
b. Bauperiode	1977 – 1979 ff.
c. Verdrängung über Wasser	3200 ts
d. Verdrängung getaucht	4000 ts
e. Länge über alles	136.6 m
f. Breite	10.1 m
g. Tiefgang	m
h. Antrieb	DM + Ew
i. Geschwindigkeit über Wasser	13.0 kn
j. Geschwindigkeit getaucht	kn
k. Besatzung	
l. Bewaffnung	m. Torpedorohre (?)
m. Ausrüstung	n. 2 Kleine Uboote

a. Number b. Building period c. Displacement, surface d. Displacement, submerged e. LOA f. Beam g. Draft h. Engines i. Speed, surface k. Speed, submerged k. Crew l. Armament m. Equipment n. Torpedo tubes (?) o. 2 submersibles

Probably some submarine accidents and also the experience on the American side led to the decision to build such rescue submarines (certainly they are mother ships for rescue submarines). Not to be precluded (at least it should be taken into account) is the fact that the incident of the Americans in the salvage of wreckage of a GOLF-Class nuclear submarine lost in the summer of 1968 in the Pacific between Hawaii and Vladivostok provided the actual background for that development. As we know, in the summer of 1974 the Americans had located the wreck lying in 6000 m of water, and managed to salvage parts of it. It would therefore be conceivable that it was decided on the Soviet side for any future cases to destroy with explosive charges a no-longer-salvageable wreck so completely that salvage by some other power is no longer productive. The on-board small submersibles are technically fully capable of placing explosive charges on a wreck carefully enough to assure its complete destruction. But even further: In cases of where a sunken submarine or other ship of other nations is lying in a favorable location will perhaps salvage operations such as the Americans conducted with the GOLF wreck be carried out?

Peak of Development: ELBRUS

In December 1981, a new Soviet auxiliary attracted the attention of the authorities when its lead ship ELBRUS passed through the Turkish Straits coming from the Black Sea. Designated as BLK-AUX-1 Class* in NATO until

*BLK-AUX - Black Sea Auxiliary

classed as a submarine tender,* it seemed to represent a logical member of

*CF. Soldat und Technik, No. 7/1982; p. 400. The statements there have been overtaken by this article and therefore are no longer valid.

a development begun in the fifties with the DON-Class tenders. Photographic interpretation provided some unexpected surprises: it was not a submarine tender, but a special submarine rescue ship which is obviously intended for the inhospitable regions in Northern Europe and in the Far East. Where the strategic nuclear submarines are stationed is apparently expected to have a greater frequency of submarine accidents, but also with more difficult conditions for rendering assistance. For those waters the Soviets needed a type which owing to its size is seaworthy and tough at the same time, which has a great enough endurance, has special equipment designed for those latitudes for its missions and can be operated for a rather long time irrespective of the weather to the greatest possible degree. One of the most important conditions in that respect is that these ships can cope with the ice conditions prevailing there. From that point of view, we envision a series of new features architecturally and in equipment. Thus the skin appears to be dimensioned especially thick and it is also longitudinally reinforced by welded-on sections (which probably serve as fenders). In conjunction with the typical icebreaker bow anchors, there are also two heavy stern anchors present; the latter are in recessed hawses in the stern loof. In order to get clear of the rudder and the screws, projecting guides angled toward the stern are installed below the stern hawses. With those four anchors, the ship is said to be able to be maintained in position at the accident site in order to be able to conduct the rescue work with the greatest possible precisions.

Table 2. Soviet Submarine Rescue Ships

Class	KOMMUNA	TELEMASR	PRUT	ELBRUS
Anzahl	1	13	9	1 (+1 im Bau)
Bauperiode	1913 – 15	1961 – 69	1958 – 66	1975 – 80
Standardverdrängung (ts)	2480	725	2120	19 000
Einsatzverdrängung (ts)	3140	840	2640	22 500
Länge über alles (m)	96.2	67.7	86.9	171.5
Breite maximal (m)	20.4	9.1	13.4	24.5
Tiefgang normal (m)	3.6	2.3	4.3	8.5
Antrieb	DM	DM	DM	W Gasturbinen
Wellen	2	2	2	2
Leistungsabgabe kW (PS)	890 (1200	2950 (4000)	5900 (8000	
Geschwindigkeit (kn)	10.0	16.0	18.0	
Brennstoff (t	82	110	200	
Fahrstrecke (sm/kn)	1700/6	3400/15		
Besatzung	104	60	120	
Bewaffnung	q keine	q keine	q keine	q keine
Ausrüstung	r Hebewerk für 1000 t	s Tauchgerät Dekompressionskammern 1 Rettungskammer	t Rettungsboot mit 2 Rettungskammern 4 gr. Festmachertonnen Feuerlöschausrüstung	u 1 (+L im Bau) Tauchgerät Rettungseinrichtungen Feuerlöschausrüstung

a. Number b. Building period c. Standard displacement d. Full-load displacement (t) e. LOA (m) f. Molded breadth (m) g. Draft, standard (m) h. Engine i. Shafts j. Power in kW (hp) k. Spped (kn) l. Fuel (5) m. Range nm/kn) n. Crew o. Armament p. Equipment q. none
r. Hoist for 1000 t
s. Diving gear
Decompression chambers
1 rescue chamber
t. Rescue observation chamber
2 rescue chambers
4 large mooring buoys
Fire extinguishing equipment
u. 1 (+L under construction)
v. Gas turbines
w. Small submersibles
Diving gear
Rescue gear
Fire extinguishing equipment

Between the forward and the after mast there is installed a hoisting mechanism. It consists of two portal cranes in tandem (with apparently longitudinally extensible crane tackle), which can be extended about 8 m to the side), making it probable that they reach about 5 m beyond each side of the ship. The forward hoisting mechaism works on the starboard side, and the after mechanism, on the opposite side. /261

The deck superstructure accommodating this hoisting mechanism has a base width in that area which corresponds to about the width of the foot of the stack. That means that the fixed, that is, the top part of the hoisting mechanism, covers about 4 m of the upper deck. Under it on the upper deck run the rails which lead out from the deck superstructure beginning close abaft the middle of the stack. The deck superstructure has a width of about 19 m at its base and a good 15 m in its upper area. Toward the front it is kept closed on each side by a two-section (possibly folding) door. The space behind it apparently serves as a hangar for heavy rescue equipment to be handled with the aid of the hoisting mechanism, submersibles or small submarines would therefore come to mind. It is presumed that there is a hoisting mechanism inside that hangar by means of which this equipment and the submersible can be placed in the desired specific position. This hoisting mechanism is probably installed on the hangar deck; the two easily visible stiffening ribs which lead around this superstructure at a distance

of about 8 m point to that. The device (or submersible) housed inside can probably be placed on a cradle with the aid of the (interior) hoisting mechanism which rolls on its rails to below the (outside) hoisting mechanism and is then lowered by it. If small submarines are actually carried in that hangar, it would not be any surprise. Such craft appear recently to be playing a prominent role in Soviet sea rescue, as has already probably been made clear by the INDIA-Class example.

What at first looked like fenders under the hoisting mechanism must now be attributed to the rescue and salvage equipment; it is a cylindrical body apparently closed at both ends, probably a tank or buoys for marking the accident site. Five of them are located below the hoisting mechanism, another three lined up are farther aft on the port side close beside the helicopter hangar. Aft, also on the port side, a lattice-work frame about 18 m in length is installed which, resting on a high rotating base, is similar to a deck crane, but is certainly no such thing. At first it appeared that it was some sort of installation for fighting shipboard fires, perhaps a long-range fire hose, but now it appears as though this frame serves to assist divers to descend and to surface and to guide them safely through turbulence at or just below the surface of the water. That frame can apparently be extended about another 7 m in length, for one like it lies directly under it on the upper deck.

Upon closer consideration, it is evident that both hangar and helicopter platforms are separated from each other by a narrow, but deep space, and therefore have no continuous connection with each other. That is established after the opening of the hangar door, which does not swing to the side, but folds down and therefore spans that space.

ELBRUS is also assigned a fire-fighting role. That becomes evident at five positions distributed over the midship section each with one hose, two on each side of the midship section and one abaft the stack along the centerline. The life rafts, apparently Type PSN-10M, are for 400 men; this safely exceeds the number of its own crew.

The absence of defensive armament does not in any way indicate that ELBRUS will remain without it. There are four positions available, on on each side of the after mast and two forward of the bridge complex, which are probably wholly suited for installing conventional weapon systems, either AK 230 AA(30 mm twin), ADMG 630 (30-mm Gatling), or quadruple SA-N-5s.

In summary, it can be said that ELBRUS by far probably represents the largest and very probably also the most capable submarine rescue ship in the world; its 19,000-t standard and 22,000-t full-load displacement and also its dimensions (see Table 2) are not exceeded by any ships with a similar function. A second ship was launched by the same shipyard in 1981, and will probably be operational before long. Possibly it is intended for the Pacific Fleet, after it appears to be firmed up in the meantime that ELBRUS is assigned to the Northern Fleet.

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